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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/866,151

05/26/2001

Takaaki Nagai

SIP-116-A

5617

21828

7590

06/16/2006

EXAMINER

REKSTAD, ERICK J

CARRIER BLACKMAN AND ASSOCIATES

24101 NOVI ROAD

SUITE 100

NOVI, MI 48375

ART UNIT

PAPER NUMBER

2621

DATE MAILED: 06/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/866,151	<b>Applicant(s)</b> NAGAI ET AL.	
	<b>Examiner</b> Erick Rekstad	<b>Art Unit</b> 2621	

-- Th MAILING DATE of this communication app ars on th cov r sh et with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 16-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 17-21, 23-27 and 29-33 is/are allowed.
- 6) ☒ Claim(s) 16, 22, 28 and 34-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

This is a Final Rejection for application no. 09/866,151 in response to the amendment filled on March 27, 2006 wherein claims 16-36 are presented for examination.

#### ***Response to Arguments***

Applicant's arguments filed March 27, 2006 have been fully considered but they are not persuasive.

In regards to the arguments related to claims 16, 22 and 28, the applicant specifically argues "Asaka does not teach use of stereo cameras 12L, 12R to determine robot position. Rather, Asaka uses a distance meter 20 and direction meter 22 (col. 5, lines 16-19) to determine robot position, and Asaka uses the cameras 12L, 12R along with the sonar sensor 14 to identify object surfaces, and avoid the corresponding object in its path."

The distance meter 20 and direction meter 22 are vaguely described by Asaka to assist the run controller 42 in controlling the mobile robot 10 (Col 5 Lines 16-30). It is viewed by the examiner that these sensors simply provided the distance traveled and the current direction of the mobile robot. The run controller further uses the environment map device (38) to provided an indication of the surroundings of the mobile robot. This indication is a two-dimensional plan view map of the environment (Col 5 Lines 22-24). This environment map device (38) is controlled by the determination of objects by the cameras (Col 5 Lines 8-15 and lines 20-24). By the cameras providing an indication of the location of objects the cameras are essentially providing a relative

position of the robot to the objects. The claim requires only a calculation of the position of the moving robot which the cameras provided by the use of the hypothesis (34) (Col 8 Lines 27-33).

The applicant further argues that Asaka does not teach the use of characteristic points. Asaka teaches the use of the cameras to determine where brightness abruptly changes and defines a line segment for the abrupt change (Col 4 Lines 44-46 and Lines 61-65). This line segment is the characteristic point where the brightness abruptly changes. These characteristic points are then used to determine the position of the object (Col 5 Lines 1-7). It is suggested by the examiner to amend the claims to further define the applicant's invention. Specifically to define "position" and "characteristic point".

The applicant further argues that Asaka does not teach the use of the characteristic points to calculate the position of the moving robot. As shown above, this information is used provided a map of the surroundings of the robot which is used by the run controller (42) to move the robot. By providing an environment the characteristic points have provided a position of the robot relative to its surroundings.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim s 34-36 recites the limitation "from the two brightness images obtained with the cameras" in claim 16. There is insufficient antecedent basis for this limitation in the claim. Claim 16 and 34-36 do not teach the use of the cameras to obtain brightness

images. The correlation between the cameras and the existing apparatus must be defined.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 16, 22 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 5,525, 882 to Asaka et al.

[claims 16, 22 and 28]

As shown in Figures 1 and 2, Asaka teaches a position detection apparatus for detecting a position of a moving robot. The position detection apparatus comprises a local image acquisition device (12R) for acquiring an image of a forward field of view of said moving robot. The apparatus further comprises a distance image acquisition device (12L), having the same field of view as the local image acquisition device. The distance image acquisition device acquires a distance image simultaneous to acquisition of an image by the local image acquisition device. A characteristic point extraction device that extracts respective characteristic points from the images by a specific method (Col 6 Line 55-Col 7 Line 12, Fig. 4A-C). Asaka further teaches a reference characteristic point selection device that selects a reference characteristic point for calculating the position of the moving robot, based on the characteristic points and the distance image (Col 4 Line 53-Col 5 Line 7).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asaka as applied to claims 16, 22 and 28 above, and further in view of US Patent 6,148,250 to Saneyoshi et al.

[claims 34-36]

As shown above, Asaka teaches the apparatus, method and program of claims 16, 22 and 28. Asaka teaches the use of two cameras (12R and 12L in Fig. 2) to obtain brightness images (Col 4 Lines 35-46). Asaka does not specifically teach the distance image pixel represent the distance from the camera.

Saneyoshi teaches a similar means to obtaining the distance from a camera by using two cameras (10a and 10b in Fig. 1) (Abstract). Saneyoshi further teaches the pixels for the images obtained by the cameras represent relative brightness (Col 3 Lines 3-9). Saneyoshi teaches the storing of the distance information as a distance image (Col 3 Lines 24-48). Saneyoshi teaches such a means in order to accurately detect the distance. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the distance image of Saneyoshi with the object detecting means of Asaka in order to accurately detect the distance to the object.

***Allowable Subject Matter***

Claims 17-21, 23-27 and 29-33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

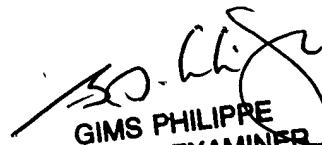
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erick Rekstad whose telephone number is 571-272-7338. The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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